AUGUST 1990

$2.50

H-SCOOP

#125

The double density newsletter for Heath/Zenith computer support

BITS & PIECES

QUIKDATA BITS

Miracles of miracles. As you can see, our catalog is **finally** out! Because of the Zenith fiasco and picking up our new product line which we wanted in the catalog, and many updates, etc., the catalog was very delayed. But it is here now, and I think it's the best one I've ever done. I've organized it much more so everything should be easy to find. Tell me what you think. There have also been drastic price reductions in some areas, especially memory chips. And I'm pleased to say that very many products, disk drives, hard drives, monitors, video cards, etc., have had prices reduced.

Please make one change. On page 22, the prices for the 80287-10 and -12 are reversed. Enjoy your catalog and keep it handy. We are here to serve you and fill your computer needs.

Help! **Need some Tandon full height 100-2 drives**. Just sold our entire stock to a government contract and although we normally do not sell many anymore, I would like to have a few in stock. If anybody has some around they want to get rid of, let me know. I will pay $25 for working ones in good condition. Then we'll take them apart, clean, lube, align, etc., and shelf them.

H-SCOOP may be getting out a bit late because of this catalog business. So what am I doing for more excitement now? Working on the new catalog addendum! No kidding. Have already added some products. Also working on a new and updated liquidation list. This is a big job and takes time. Be patient with this. Those with modems are best off to check our bulletin board for both the addendum and liquidation, as the board is more up to date than the printed material we hand out.

And just before press time I find out that our good friends the Teamsters Union at UPS may be going on strike on August 1st. I understand they have been offered a good contract and at this point are refusing to even talk about it or let management negotiate properly. If they strike, they could knock out UPS shipments for quite some time. This will prove to be an extreme hardship for mail order companies like Quikdata, who depend on mostly all shipments both in and out for our customers. Just wanted to warn you. Thus as luck may have it, new catalogs come out and nothing may go out! Well, we'll just keep our fingers crossed on this one and hope the Teamsters wake up in time.

ZDS NEWS

ZENITH DATA SYSTEMS REDUCES PRICES ON DESKTOP SX, PORTABLE '286 SYSTEMS

MEMORY PRICES LOWERED 20 PERCENT

On July 12, 1990, Zenith Data Systems (ZDS) reduced the suggested retail prices of its desktop Z-386SX and portable SupersPort 286e personal computers (PCs) by $300, or up to 9 percent. ZDS also lowered its expansion memory prices by about 20 percent.

"We expect 386SX-based PC sales to continue their record-breaking pace, as the market grows increasingly competitive with promotions and pricing actions," said Arthur Lambert, ZDS vice president of sales and marketing. "This price drop, combined with our recent strategy to bundle a mouse and factory-install Microsoft Windows 3.0 and Asymetrix ToolBook on the hard drive models, has allowed us to add almost $1,000 of value to these systems within the last two months." [Art, your customers don't want more goodies thrown in to think they are getting a good deal, they simply want lower prices up front!]

The Z-386SX Model 1, which has a 16-megahertz Intel 386SX processor, 2 megabytes (MB) of memory, a VGA video card and a 1.44MB 3.5-inch floppy drive, now has a suggested retail price of $2,999, down from $3,299. The prices of the Model 40, which has a 40MB hard drive, and the Model 80, which has an 80MB hard drive, are now $3,699 and $4,399, down from $3,999 and $4,699, respectively.

In response to growing demand for 80286-based portable PCs with VGA video, ZDS lowered the prices of its SupersPort 286e Model 20 and Model 40 to $4,399 and $4,699, from $4,699 and $4,999 respectively.

In addition, ZDS has reduced the suggested retail prices of expansion memory for all portable and desktop PCs by 20 percent. Prices of 1- and 2-megabyte memory chips have been lowered to $399 and $799, from $499 and $999, respectively.

Editors note: Second source vendors usually sell 1 meg RAM upgrades for about $100!

NEW DESKTOP '286 UPGRADES TO SX PROCESSOR

On July 10, 1990, An 80286-based personal computer (PC) that can be upgraded with an Intel 386SX processor was introduced by Zenith Data Systems (ZDS).

The new Z-286 LP Plus is ZDS' first system designed to be easily upgraded with a faster processor.

Based on a 12-megahertz (MHz) 80286 processor, the Z-286 LP Plus is a low-cost, all-purpose computing platform designed for word processing, spreadsheet analysis, desktop publishing and simple graphics applications. The system's upgradeable design allows it to keep pace with users' advancing needs while preserving their PC investment.

"Although '386-based systems clearly represent the best long-term PC investment, '286-based systems still offer significant value and performance," said Arthur Lambert, ZDS' vice president of sales and marketing.

When the user demands faster performance and 32-bit compatibility, the Z-286 LP Plus can be upgraded with a 16MHz 386SX processor by the user in less than five minutes. The system's 12-megahertz 80286 processor is mounted on a removable card that can be replaced by an upgrade card featuring a 16-megahertz 386SX. The processor cards also have coprocessor sockets. This SX upgrade will increase performance by more than 25 percent in typical DOS applications. Coprocessor sockets are included on the cards. The upgrade card has a manufacturer's suggested retail price of $599.

The new graphical user interface, Microsoft Windows 3.0, which we've pre-installed on the hard disk systems, will further aid a

swift and seamless migration to 32-bit computing," he said.

Standard features of the Z-286 LP Plus include VGA video, 1 megabyte (MB) of memory (expandable to 16MB, 8MB on system board), three open slots and a 1.44MB 3.5-inch floppy disk drive. The Z-286 LP Plus also is available with a 20MB or 40MB hard disk drive, which both have an access time of 28 milliseconds and 1:1 disk interleave.

Other Z-286 LP Plus features include: Two 9-pin serial ports; 25-pin parallel port; Real-time clock with battery backup; 101-keyboard; Microsoft Mouse with hard drive models; Microsoft Windows 3.0 pre-installed on hard drive models; MS-DOS 4.0 pre-installed on hard drive models; One-year warranty.

The Z-286 LP Plus offers three security features: Cabinet cover key lock to prevent unauthorized opening of the cabinet; Lock-down loop to secure the system to a work surface; Password protection to prevent unauthorized access to the system.

The Z-286 LP Plus' small cabinet measures 14 inches wide, 15 inches deep and 3.8 inches high. The suggested retail price for the Model 20 with a 20MB hard disk drive is $2,399, and the Model 40 with a 40MB hard disk is $2,699. For network node applications, the Model 1 with a 1.44MB floppy disk drive is $1,999. The suggested retail price for the 386SX upgrade card is $599.

The Z-286 LP Plus Models 20 and 40 come with a Microsoft Mouse as well as Microsoft Windows 3.0 and MS-DOS 4.0 factory-installed on the hard disks. The system measures 14 inches wide by 15 inches deep by 3.8 inches high, offering a small footprint.

UPGRADE TIME FROM ZDS

MS-DOS 4.0

Zenith customers can now upgrade to MS-DOS version 4.0 (OS-105-MS) for $49. This offer is good until December 31, 1990. If you are a registered owner of a previous version you should be getting an update card from Zenith with full instructions.

Version 4 has some new features, most which have been available in other software packages such as PC TOOLS and stand along programs for a long time. These include the following:
DSKSCAN - scans the entire disk searching for bad sectors trying to recover data contained in any bad sectors.
EMM386.SYS - allows MS-DOS programs and applications to use extended memory as well as expanded memory (EMS ver 4). Only for 386 systems.
HIMEM.SYS - allows MS-DOS programs on computers with extended memory to access the extended memory (XMS ver 2.0).
INSTALL - executes a command during CONFIG.SYS processing.
MEM.EXE - displays the amount of memory and a list of programs that are loaded.
REM - allows for comments to be placed in the CONFIG.SYS files.

Include $4.50 shipping and handling plus your state tax. If you don't have the coupon, read on.

NO COUPON UPGRADE TO MS-DOS 4.0

Zenith Data Systems' normal procedure for handling its software upgrades is for its Software Registration department to mail an upgrade coupon to registered owners of its software. Software Registration will also accept upgrade orders according to the following procedure:

1. Photocopy your distribution disk(s) of the relevant software product.

2. Complete the form at the bottom of this sheet. Be sure to specify whether you want 5.25" or 3.5" diskettes. If you do not specify, you will be shipped 5.25" diskettes.

3. Mail the completed form, the photocopy, and full payment to: ZDS Software Registration/ Attn: Kathryn Tollas/ P O B 1000/ St. Joseph, MI 49085

Please do not use this coupon until after July 7, 1990, and use it only if you have not received a printed coupon in the mail by then.

Payment: Purchase Orders are not accepted. You may pay by check or by ZDS Credit Card, Visa, or MasterCard. You must include $4.50 shipping for each item, and any applicable sales tax.

Sales Tax: Include local sales taxes if you are ordering from these States: AL, AR, AZ, CA, CO, DC, FL, GA, HI, IL, IN, KS, LA, MA, MD, MI, MN, MO, NC, NJ, NM, NY, NH, OH, OK, PA, RI, TN, TX, UT, VA, WA, WI.

FAX orders: As an additional courtesy, you may order by FAX if you pay by ZDS Credit Card, Visa, or MasterCard. FAX the completed form below and the photocopies of your distribution disks to: (616) 982-5099.

Please send payment in U.S. dollars only.

This offer expires December 31, 1990. Not valid in combination with other offers. Prices, availability, and specifications subject to change without notice. Void where prohibited or taxed by law.

MS-DOS is a trademark of Microsoft.

The Zenith Data Systems COM1 Upgrade Order Form

PRODUCT	PRICE	QUANTITY	AMOUNT
MS-DOS 4.0 OS-105-MS (5.25") OS-103-MS (3.5")	$49.00		$
SHIPPING	$ 4.50		$
SALES TAX			$
TOTAL			$

[ ] Check enclosed
[ ] Charge to
  [ ] ZDS Credit Card
  [ ] Visa
  [ ] MasterCard
    Card Number:
    Expiration Date:

Your Signature: _____

SHIP TO:
NAME: _____

COMPANY: _____

STREET: _____

CITY: _____ STATE: ___ ZIP: _____

* Note that ZDS cannot ship to a post office box. You must use a street address.

WINDOWS UPGRADE

I received several upgrade coupons for DOS 4, but what also surprised me is that I received an upgrade order form for Windows Version 3.0 for $49. If you have ever had a registered previous version of Windows you should receive one.

ZENITH DATA SYSTEMS
Upgrade to Windows version 3.0

Imagine, only $49, for all the benefits of Windows v.3.0, including: Program Manager, an organizational life-saver; A graphical directory tree called File Manager, that makes file maintenance easy and lets you connect to and disconnect from network servers while inside Windows; Special productivity tools. Like Microsoft Windows Write. Paintbrush. Terminal. Recorder. Clipboard. Program Information File Editor. And Control Panel. Plus, Windows v.3.0 shatters the 640K memory barrier, giving you access to up to 16MB of memory.

Minimum configuration requirements to run Windows 3.0, and, more importantly, optimal configurations to achieve expected operating performance depends on the mode you will be running it in. Real mode, standard mode, or 386TM enhanced mode. The mode that you use depends on the equipment you have and the software applications you want to run under the Windows environment.

Real Mode is the operating mode that provides maximum compatibility with previous versions of Windows applications (2.x versions). Real mode is also the only mode available for computers with less that 1 megabyte of available memory.

Standard Mode is the normal operating mode for running Windows. This mode provides access to extended memory on 80286 systems and above, and also lets you switch among non-Windows applications.

386 Enhanced Mode provides access to the virtual memory capabilities of the Intel 80386 family of processor. Virtual memory capabilities let Windows applications use more memory than is physically available by using disk space. Enhanced mode also allows for multitasking of non-Windows applications.

Based on the mode you want to run in, you can determine if your system hardware has the appropriate requirements to perform effectively. The **minimum** software and hardware requirements your computer system needs to run Windows 3.0 successfully are:
MS-DOS 3.1 or later.
For **Real Mode**, a system with an Intel 8088 processor and 640K of conventional memory available.
For **Standard Mode**, a system with the Intel 80286 processor and 1 megabyte of available memory (640K conventional memory and 256K extended memory). Note that expanded memory (EMS) only available above the 640K will NOT suffice.
For **386 Enhanced Mode**, a system with an Intel 80386 SX processor or above and 2 MB of available memory (640K conventional and 1024K extended).
A hard disk with 6 to 8 megabytes of free disk space and at least one floppy drive (to load the software initially).
A minimum of a CGA monochrome monitor.

Although a mouse is not required it is highly recommended so that you can take full advantage of the easy-to-use graphical interface.

Obviously, the more powerful your system, the more effective Windows 3.0 will be. But the single most important hardware feature you may want to upgrade will be memory. Zenith Data Systems recommends that although Windows 3.0 will run on an 8088 based system with 640K of memory and a monochrome monitor, it is not an appropriate system to take advantage of Windows capabilities. Zenith Data Systems highly recommends that Windows be run at least at a minimum configuration to support **Standard Mode** - that is a 80286 based system with 1MB of available memory (640K conventional, 256K extended). Be sure to note that most systems only offer extended memory beyond the first 1MB of installed memory so if your system has ONLY 1MB total memory it is unlikely that you have available extended memory to run Standard Mode. Additional memory is highly recommended if you expect to be running multiple programs simultaneously.

So what's with all these upgrades? For a long time upgrades seem to have vanished. Now I suddenly receive three coupons for items I have not registered for ages - many versions back. My guess is ZDS is having a bad cash flow problem because of their Medallion program and need to generate some fast cash.

ANAPRO NEWS

Today I am on the subject of IBM floppy disk select lines. To those of us who are used to setting the drive select jumper on a floppy drive, the IBM twisted cable routine seems strange and confusing. Well, there **is** a reason why IBM chose to do it, but I am VERY ready to agree that it is still confusing and frustrating!

The reason for my current comments on the subject is that I was trying to install a third drive in my 386 PC clone. For those not completely familiar with the PC configuration, let me explain the setup. In the original PC, there was provision for two DSDD 48tpi floppy drives. Apparently to make production assembly, parts stocking and field service simpler, IBM came up with a scheme where all drives had the same drive select jumper. [Editors note: As I have written up earlier, I believe the real reason was because with the twisted scheme only one drive motor will run at a time. I've heard the early PC power supplies were so marginal they could not handle two floppy drive motors being on at the same time!] To accomplish this, a special ribbon cable was made where seven of the conductors were reversed so that each drive connector would receive a different select signal while still tied to the same pin. This may be fine if all you need is two drives, but then IBM must know best!

Along came the AT class of computer and now we have a 1.2Meg and 360K drive possible. Still is no problem when you have a hard disk as the AT does have. Now enter the PS2 series and we add a 3 1/2 inch drive format. Fortunately, the 720K and 1.44Meg formats can be handled **reliably** by a single 3 1/2 inch drive.

There is no such compatibility between the 1.2Meg and 360K drives since the first has 80 tracks (96tpi) and the latter has 40 tracks (48tpi). So to be fully compatible, you need to have three drives in the system. Note that some versions of the 1.2Meg drive will also support the 720K 5 1/4 inch format which was little used on the IBM but may be of interest to CP/M users such as myself. I use Uniform to transfer CP/M to and from MS-DOS as well as running CP/M programs on a co-processor board.

Now comes my problem. I need the third drive, but the controller only recognizes two drives since that is all that IBM said is needed. That is bad enough but I can somehow install a switch or some hardware mod to enable the needed select line for the new drive. The frustration comes from that damned twisted ribbon cable which isn't even done logically! Also, drive select line designations are not standard.

Here is what I came upon in my investigations and tribulations:

Disk drives have select lines which can be labeled D0, D1, D2 and D3 or D1, D2, D3 and D4. What makes for a horror story is that the pins to which these designations are actually tied will vary among manufacturers. The following table may be of help to others and save them the time I wasted. It shows the ribbon cable pin number, the CP/M drive select designation, the IBM PC

drive select designation, the effective IBM selection with reversed cable and the three labels I have found used by different drive manufacturers.

pin #	CP/M	IBM	IBM rev	A	B	C
6	D3	res	res	D3	D4	D0
10	D0	D0	mot	D0	D1	D1
12	D1	D1	res	D1	D2	D2
14	D2	res	D1	D2	D3	D3
16	mot	mot	D0	mot	mot	mot

Note that all odd pins are ground. "mot" is motor, "res" is reserved.

Brand A configuration is the most common today and includes Teak, Tandon and Fujitsu. Brand B includes Shugart. Brand C includes Siemens and is the way CDR Systems has labeled their controllers.

For reasons I do not understand, IBM chose to flip conductors 10 through 16 in the ribbon cable and set the drives to D1 (pin 12). This forces the controller pin 10 (D0) to function as a motor on signal for the flipped drive and pin 14 (D2) as the actual drive select.

In my own DTC controller, pin 14 of the controller activates on any select. The motor control (pin 16) then must control the activation of the second drive which is connected to the unflipped section of the ribbon cable. Sound confusing? It is, and we have IBM to thank for it! Good old IBM, may the flipped ribbon cable find an appropriate location to rest itself. The activation logic for the DTC controller is summarized in the table below.

select	pins				
drive	6	10	12	1	16
off	X	-	-	-	-
0	X	X	-	X	-
1	X	-	X	X	X

X means that the line is active (a 0 volt level).

I know that Henry has commented on this subject, but I have not seen a tabulation of it before. If anyone has any comments or corrections to this, I we would all be grateful. - Peter Shkabara

MISCELLANEOUS BITS

* Just a note to say that I received the $600 **Z-515 4M card** the morning we were leaving for a trip to the West coast and to Wisconsin. (Did not have time for a drive over to Sheboygan for a visit). After returning, I was able to get it installed and running with no trouble. Must admit that I did take advantage of the comments that Bill Adley made in the April issue of REMark. I am using 1 Meg for extended memory as logical drive F: where I use PC Tools and PC Desktop as TSR's. They seem to work ok, and are very fast in operation since I also am using PC Cache. So far, as they say, No Problems!

I wish you lots of success in your new venture of putting out your own brand of computer systems. I know they will be at least as good as anything else available. For several friends that I have that I know are interested in getting a system (they are really novices as far as computers are concerned) you will get my highest recommendation. So, will be looking forward to your new catalog. Ed Kroencke

* Henry, updating from H-Scoop #123, **the latest WordPerfect 5.1 interim release is 3/30/90**. Other interim 5.1 releases were 11/6/89 and 1/19/90.

Quite a success story for WordPerfect - very little advertising in magazines or trade journals, other than their own company publications - **lots** of positive word-of-mouth advertising from the myriad of our population who are happy and enjoy the product.

There are about 20 of the 800-lines for various products and detail levels of user support available Monday through Friday from 7 a.m. to 6 p.m. Mountain time. User support is even available from 6 p.m. to 7 a.m. Monday through Thursday and until midnight on Fridays on toll lines, but, of course, at our lower evening and night rate.

Additionally, as important to me, WordPerfect's use of a good share of my expanded memory, make the program much faster for me.

I was sorry to learn that WordStar ended their 800-line support on June 1. It will be interesting to see whether the new management team at Ashton-Tate can regain any of the lost customer support and loyalty, which once they had. John R. Miller

* **How much power does the MinisPort require**? It's hard to believe that the internal nicad battery will power the thing according to the owners manual (page 1-4) where it states "for 115 volt systems, a minimum of 15 amps is required"! This translates to 1725 watts!! With the internal nicad battery used alone, the machine should get about three seconds of use before the battery is dead! I guess they have liquid nitrogen circulating inside the power supply in the unit to dissipate the heat generated by the 1725 watt unit. Wonder who wrote that manual.

* Why does Zenith use such weird RAM for their computers? A standard 2 meg upgrade for most -AT class computers goes for about $200, but Zenith's list price for theirs is in the $1000 range.

* **Problems have been reported with the Z386/16 and Microsoft Windows 3**. Some problems exist which will prevent the windows from booting properly at all in the standard or EMS mode. There evidentially was a problem with the Windows not being designed for drive partitions over 32 megs. I guess a "swapfile.exe" file is supposed to fix that. Problem is that Windows uses the hard drive to swap info back and forth like an electronic disk, and it was not set up properly for larger drives. I also understand some swapfile.exe files do not work properly. I heard that Zenith's versions contains the proper file, but I have a customer who said the Microsoft version still did not work on his Zenith system with an 80MB hard drive. Rumors also have it that this problem may exist on the SupersPort 286e version.

Another problem existed where disk fragmentation could occur if the hard drive had over 1023 cylinders.

There was still another which supposedly could be cured by upgrading an I/O bus pal to a version 5, which seems impossible to get. More on this later.

I just happened to get a call from Mr. Todd who is familiar with Windows. In fact he is a beta test site and he said most of the problems should not exist if the Windows is installed for a Zenith machine, and proper switches are set indicating Zenith machines when setting things up. He stated that he'd be glad to be of help to those who may be having problems with Windows. Phone number is (319) 275-4423

* **2.8 megabyte 3.5 inch drives are now available**. Problem is, the diskettes now cost about $10 each retail! I suppose as these drives become popular that price will drop. I remember when 360K disks cost $5 each, and recently when the 1.4 megabyte disks cost almost $5 each.

* Last month we published in Technical Forum, an article on how to use a modem on the Eazy PC computer on the mouse port, which was done by Dave Brockman. He has since contacted me and said the needed cable can be obtained from Radio Shack as part number 26-269. It is a D9 to D25 cable.

Dave also mentioned that he has found a modem program to work better than the Qmodem program. It is a public domain program in the file BOYAN40A.ZIP which is available on some bulletin boards or from public domain sources.

* With the cost of RAM now at an all time low, now is the time to get the extra RAM for goodies such as CACHE, VDISK, EMS memory and whatever. I recently added more RAM to my QD computer 386/25 and using PC TOOLS V6 have allocate 3 megabytes to my drive CACHE. Makes a big difference, and didn't cost much. When I used to print out my customer database, for instance, my hard drive light would flicker each time a new name was printed, meaning it was fetching from disk the next one. Now I can print out lots of names, maybe 50-100 before the hard drive light comes on again. Order entry screens also come up much faster and the response dealing with variolus databases being open and closed is much faster. I also noticed my spell checker working faster. In general, more speed and less hard drive activity. Although you can also set it to cache floppy drives, I chose to exclude those as I only use them to load the hard drive.

REQUESTS

* NEED VIDEO DRIVERS for Zenith VGA card and Lotus ver 2.2. I am looking for a good driver that will give 25 lines x 132 cols in Lotus spreadsheets. I have tried IMPRESS and SeeMore but the characters are jagged and spindly so text is hard to read especially after a few hours. My standard is an old Paradise Autoswitch EGA 480 card with a Zenith 1380 EGA monitor on a Zenith 151. Paradise supplied a 25 x 132 driver for Lotus that was excellent. The sharp, well defined characters were easy to read. Since we went Hi-tech with all this VGA stuff, nothing has yet come close to Paradise's driver. If you know of any drivers, please let me know. Thanks. Frank Clark/ Dept. of Physiology/ Univ. Nebr Med. Cntr./ Omaha, NE 68198-4575.

* Letter received from Stephen C. Scott regarding: Inquiry on upgrading a Z-286 to an 80386SX machine.

I started out with a Z-151 in 1985, and you may recall letters from me in earlier years about problems I overcame installing an expanded memory board and other enhancements in that machine.

A couple of years ago, I moved up to a Z-286 (functionally the same as a Z-248, but in the smaller Z-151 size case) with a fast 40MB hard disk, color VGA monitor, and 4MB of expanded RAM memory on an Intel Aboveboard.

For some time now I have been searching for an economical way to upgrade my Z-286 to an 80386SX machine. I know that the 80386SX wouldn't give me much more speed, if any, but I'm more interested in the memory management features than speed since the great bulk of my work is word-processing.

I know from reading REMark that the ZX-386 by American Micronics, Inc. and the Z-Master 386 from AOX, Inc. are available and would boost my computer to full 80386 power. However, the last time I looked, the least expensive of these upgrades was around $1,000 with OK memory.

I have investigated a couple of miniature (approximately 2" x 2") 80386SX cards which are designed to fit into an 80286 socket and which are priced more in line with my budget, i.e., in the range of $400 to $500. These cards are from Cumulus and Evergreen, respectively. However, neither of them will fit in a Z-286 because the 80286 socket is mounted at the top of the system board which would leave insufficient clearance from the top of the case for the 80386SX card. These 80386SX cards appear more suitable for systems which have motherboards mounted in the base of the cabinet rather than systems like the Z-286 in which the "motherboard" is actually an expansion board. One thought that occurred to me is that it might be possible to use the Cumulus or Evergreen 80386SX mini-boards by cabling the 80286 socket on the Z-286 system board to the matching socket on the 80386SX board. However, my inquiries with local computer dealers and computer parts suppliers have turned up no such cables. Also, I don't know whether such an arrangement would be desirable from reliability and EMI standpoints.

I have also read a rumor in a computer magazine that Intel may be developing a version of the 80386SX that could directly replace an 80286. But I'm not holding my breath because such a development would not seem to make economic sense for Intel, whose interest surely lies more in selling more new boxes than providing an easy upgrade path for the millions of 80286 machines out there.

So, the purpose of this letter is to inquire whether you or your readers are aware of any relatively inexpensive ways to upgrade a Z-286 or Z-248 to an 80386SX machine. Any thoughts? Stephen C. Scott/ 1001 E Walnut St, Suite 300/ Columbia, MO 65201/ (314) 443-1602 (day). [Editors note: I don't know, the AOX and AMI are high priced and from what I understand, Stephen has the 286LP. I checked with AOX and they said they have not tried their board in that system, but doubt that it would work. I know of no other way, other than our SOTA card where a 386SX 16Mhz for $395 would give him the 386 power, but then memory is another story. Anybody know of anything that will work in a 286LP and is not very expensive?]

* I currently have 448K of memory (192 base + 256 on a Z205). I have a second Z205 memory but do not have documentation for it. I am not sure if it is possible to install more than 1 memory board but there are several dip switches and jumpers on the board. I'd appreciate any help I can get on this board. And is there any RAM Disk software available other than the 64K VDISK that comes with MSDOS? Gary S. Melander/ CPO Mess/ USS Saipan (LHA-2)/ FPO New York, NY 09549-1605. [I no longer have any doc around for those boards, perhaps one of you could help out Gary]

REPORT

SOTA 386SX ACCELERATOR AND H/Z151

Last month we started this article on installing and using the Sota 386 SX accelerator in the H/Z151 computer, written by Ronald Pannatoni. The article was too long to fit last month's issue, so we will conclude it here.

Ron did mention that since he's written this article he's gathered additional information and has had some other problems. If available, this footnote will be printed next month.

BENCHMARKS: The principal benchmark of interest to FORTRAN programmers is the Whetstone. It involves arithmetic operations, array manipulations and evaluations of the basic transcendental functions. By executing a few small DO loops many times, this program finds the time spent by the computer on a "typical" numerical operation, the "Whetstone". The practice is to report the reciprocal of this result as a frequency, that is, as "Whetstones per second".

It is important to specify the compiler that is used to generate the actual executable code for the Whetstone benchmark. I used Microsoft FORTRAN 4.01. The source code that I used was distributed by Microsoft with the compiler. It includes only seven of the ten subprograms in the standard code.

The results given below are for the Whetstone benchmarks that use double precision arithmetic. I got 80,330 Whetstones per second for the double precision tests on the Z151 with the 8087

coprocessor. I got 418,900 Whetstones per second for these tests on the Z151 with the 386si and the 80387SX installed.

These results mean that processing speed increased by a factor greater than five. I believe one should not expect this much gain in "average" applications, however. The executable Whetstone code is just 32K bytes in size, and this code consists mainly of small DO loops. I believe that the 16K byte memory cache on the 386si probably is used to much better advantage in these tests than it would be with larger code that had a smaller density of DO loops. Experience with my own application codes suggests that a factor of four is more representative of the average gain in system performance. The benchmarks that I shall discuss below suggest that this improvement is primarily due to the 80387SX.

When I bought my 80387SX from MicroWay, this company included a disk with several test programs. One of these programs is a set of benchmarks called PI87. It was written by Steve Fried, who is the principal scientist and vice president of research at MicroWay. These benchmarks are discussed by Fried in his article about PC accelerators in the "BYTE" 1986 Extra Edition called "Inside the IBM PC's". Seven of the tests are briefly characterized as follows.

1. Floating point - arithmetic
2. Floating point - Savage (transcendentals)
3. Data bus bound - 4K bytes of instructions
4. Data bus bound - 4K bytes of register moves
5. Data bus bound - 16K bytes of instructions
6. Clock bound - 4K byte block moves
7. Clock bound - 16K byte block moves

Tests (1) and (2) are dominated by the numeric coprocessor, and tests (3) through (7) are dominated by the CPU.

PI87 produces a number called a "performance index" for each of these tests as well as for some other tests that I shall not discuss. The performance index is basically the factor of speed increase over an IBM PC/XT clone with an 8087 executing the same test. Thus, the performance index for each test should be 1.0 for the Z151 with 8087, but I did not verify this on my Z151 before installing the 386si. I thought it would be more meaningful to present the performance indices obtained with a few other accelerators. The technical staff at MicroWay was very kind to provide this data to me for some of their products. These products are the following.

FastCache -- An accelerator board for PC/XT. Uses 80286/80287 run at 12 MHz. Has 8K byte memory cache.

SuperCache -- An accelerator board for PC/XT. Uses 80286/80287 run at 12 MHz. Has 32K byte memory cache.

FastCache/SX -- An accelerator board for PC/AT. Uses 80386SX/80387SX run at 16 MHz. Has 32K byte memory cache.

My results for PI87 on the Z151 with 386si and 80387SX are presented below along with the data from MicroWay. (A technician at MicroWay said that the FastCache/SX was used in a 10 Megahertz PC/AT.) The performance indices appear in the columns under the corresponding product names.

Test	386si/ 80387SX	Fast- Cache	Super- Cache	Fast- Cache/SX
1	3.55	2.02	2.01	3.55
2	4.79	2.55	2.55	5.15
3	9.35	8.18	7.74	9.35
4	14.40	10.91	10.14	14.40
5	9.92	0.81	7.68	9.92
6	3.01	2.48	2.48	5.35
7	1.48	1.5	2.44	5.33

I was pleased to see the agreement in tests (1), (3), (4) and (5) between the results for my 386si and the FastCache/SX. I cannot explain the discrepancy in the results of test (2). Note the speed advantage of the 80386SX/80387SX based accelerators over the 80286/80287 based accelerators.

MEMORY OPTIONS: SOTA advertises two ways to enhance memory with the 386si. One way is to increase the cache memory from 16K bytes to 64K bytes. The other way is to add a board called "Memory/16i" to the 386si. Both the 386si and the Memory/16i are half length boards, and they can be connected to form a full length board.

I have tried the 64K byte cache, but it does not work. When I tried to obtain the parts for this upgrade from SOTA, I was told that the company did not sell them. These parts are static RAM chips. A message on the SOTA BBS indicated that Sony made suitable chips, so I contacted the Sony Component Products Company, which is in Texas. Sony representatives identified the correct parts. First, the chips at positions U11 and U12 on the 386si must be replaced with 100 nsec 32K x 8 SRAM's in 600 mil packages. The Sony part with this specification has the number CXK58257P-10L. Next, the chip at position U16 on the 386si must be replaced with a 55 nsec or 45 nsec 32K x 8 SRAM in a 300 mil package. The Sony parts with these specifications have the numbers CXK58258SP- 55 and CXK58258SP-45, respectively. The representatives from Sony put me in touch with the North Carolina branch of Milgray Electronics, from which I purchased the two 100 nsec chips and the 45 nsec chip. The total cost for these parts was $80.

I followed the SOTA manual and reset part of jumper JP2 to indicate that the new cache memory size was 64K bytes.

Let me note that I had only DOS memory in the Z151, either 640K bytes or 704K bytes on different occasions.

To make a very long story short, when the 386si with the 64K byte cache was installed in my Z151, the system would lock up within ten minutes from the first time that the power was turned on. If the power was turned off and back on again, the system would usually lock up before I could finish entering the date when I was booting from DOS.

In order to make certain that this behavior was not due to a conflict with other boards or software, I removed the likely suspects. I disconnected the power to the winchester drive and pulled its controller board out of the expansion slot. Thus, both of these devices were electrically separated from the system. I also removed the Hercules RAMFont board and replaced it with an old IBM Monochrome Display Adapter. These steps left my system with just one floppy drive and no video graphics memory. I also obtained replacement chips from Milgray Electronics in the hope that one or more of the original chips had been defective. I removed the VDISK.SYS device driver from my CONFIG.SYS file, leaving SOTA's 386SI.SYS as the only device driver in the file. None of these changes made a difference, however. The system would still lock up a few minutes after power was turned on.

I have not tried the Memory/16i board.

For the three months that I have tried to solve the problem with the 64K byte cache upgrade, I have sifted through hundreds of messages on the SOTA BBS. Among these messages I have found several that come directly from the technical staff at SOTA and that either modify or contradict claims about the Memory/16i board in the sales information for this board. To conclude this review, I am reporting the gist of these messages here.

First, the Memory/16i is advertised as supporting up to 8M bytes of "0" wait state memory. At present, however, the Memory/16i has the capacity for 4M bytes of memory. This memory is 80 nsec DRAM in SIMM's. The Memory/16i board used to be run with one wait state. It has an option for "paged memory", which can effectively reduce the "average" wait state to some fraction like 0.8. This may be what the "0" in the SOTA sales information

meant. SOTA has recently introduced hardware changes to this board to run it optionally with no wait states, but it is still being shipped with the 80 nsec SIMM's. According to the article "Keeping up with the CPU" in the Fall 1988 "BYTE" IBM Special Edition, there is no way for 80 nsec dynamic RAM to run reliably at 16 Megahertz with no wait states.

Second, the Memory/16i is advertised as supporting OS/2. This claim means that memory on the board can be used as extended memory. Messages on the SOTA BBS indicate, however, that the board can be used only for expanded memory at present and that no software drivers for extended memory applications are available from SOTA.

Third, the sales information fails to mention that the Memory/16i bypasses all of the cache memory on the 386si as well as all of the system and EMS memory in the host computer, except at boot-up.

If you choose to get the Memory/16i, make certain that it is configured for Zenith computers [Quikdata sells the versions for Zenith computers]. According to the technical department at SOTA, the board must be modified to work with the "nonstandard refresh rate used by Zenith".

TECH FORUM

EMM MEMORY WITH 386/16

Editors note: Robert Bartels sent me a copy of a letter he sent to William Adney in reference to a REMark article. It may help you 386/16 users properly set up your RAM cards for EMM memory.

Your article "How To Use EMM.SYS" in the January 1990 issue of REMark does not disspell the confusion over extended and expanded memory on the Z-386/16 entirely. In fact, it has made it a little more confusing to me.

To install extended memory on the Z-386/16, and only extended memory, with either the Z-505 board, or the Z-515 board, or both, one must, as you say, set the switch SW 401 on each board to OFF, but one must also reset the DIP switches on the CPU card before running SETUP. This is an important step. The DIP switches on the CPU card must reflect the total amount of memory determined by the type and number of Zenith boards installed including CARD 0 (the BASE MEMORY CARD). The Installation Guides for the Memory Expansion Cards calls this memory (that is, the memory excluding that which is assigned to EMS) "System Memory".

To install expanded memory by the addition of the Z-515 4MB board you avoided stressing the fact that you can only obtain 2MB of expanded memory from this board by enabling EMS with the setting of section 2 of the SW401 switch to ON. It appears that one can get the full 1MB of expanded memory with the Z-505 1MB board by enabling EMS, but not the full 4MB with the Z-515 board. I have not tried verifying this with my Z-505 board though I have both types of cards added to my Z-386/16. I do know that the Z-515 board behaves as described above. This is easily demonstrated by enabling EMS on the Z-515 when it is the only added board and then setting the following in CONFIG.SYS (but not at the same time) before rebooting the computer: **device=vdisk.sys XXXX /e** and **device=vdisk.sys XXXX /a** where XXXX specifies a disk size in kilobytes greater than 2048, for example, 4096. If then one selects the RAM Drive and runs The HUG File Manager (HFM) on the empty drive, it will in both cases report only 2048K of FREE SPACE. In other words, it reports that the Z-515 with EMS enabled actually provides 2MB of extended memory and only 2MB of expanded memory.

Again, after selecting the desired EMS memory by enabling appropriate switches one must set the DIP switches on the CPU board to reflect the total amount of system memory (the total amount of non-EMS memory determined by all boards including the BASE MEMORY CARD); this before running SETUP.

I suspect your readers will be disappointed when they learn that a 4MB Zenith board will only provide them with 2MB of expanded memory when using Zenith's standard EMM.SYS driver. I certainly was. I have tried using Quarterdeck's Expanded Memory Manager 386 (QEMM) to simulate expanded memory for the full 5MB of extended memory that I now have installed but haved failed. FoxPro from the Fox Software Company is claimed to work when expanded memory is available, and to make use of memory in that range. However, when QEMM is activated, FoxPro goes into a spin and a cold restart of all systems is required. I must confess, however, that FoxPro does work with EMM.SYS and the 2MB of expanded memory that is presently in my memory configuration using the 4MB board.

CLASSIFIEDS

Classified ads can be placed in this section free of charge by any H-SCOOP subscriber. Non-subscriber's ads are placed at $10 per insertion in advance. Ads to appear more than once must be submitted separately each month publication is desired - maximum 2 months with 2 month wait. When placing ads, try to keep in mind the 'devaluation' of computers and components and adjust your price accordingly.

FOR SALE–yet another H89. Has an on-board hard sector drive, 2 external 720K drives with the H37 controller, amber monitor, Kres 2/4 Mhz mod, software and misc items. Works fine. Make offer. Frank Clark/ 913 N. 49th Ave.,/ Omaha, NE 68132

QBBS

This column which will be printed from time to time will contain messages from our Quikdata Bulletin Board System, a TBBS system, which were left from readers and customers. When some important information is on the board and perhaps relevant answers appear, we will print them in this section.

From: BRIAN HANSEN
Subj: Z386-16 TRASHES DISKS

I have found a strange problem when using my Z386-16 computer with 2 1.4M 3.5" drives. From the VER command. BIOS Version 3.30.05 MSDOS Version 3.30 [ZDS MSDOS 3.3+] Monitor Rom 2.6E. Z525 Cache card, Z515 4M ram no EMS enabled. Drives set to Media Sensed by drive. The drives are Toshiba brand [ND-3561BR]. Problem if I use a 720K disk in the drive and it is write protected and I try to write to it I get the normal error message and if I remove the disk and move the tab to enable a write and reinstall the disk and use the 'R' to retry my disk is dammaged. I then get a Probabably not a DOS diak error and the directory and FATs are wiped out. This happens with both disks formatted with DOSs Format or the PCTOOLS V5.5 Format programs. 1.4M disks don't seem to do this. If I abort and then retry from scratch all is also ok on both a 720K or 1.4M disk. I have done more testing and found that if the DTC controller is changed to a Western Digital WD-1003-VMM2 the problem doesn't happen. The DTC controller works ok in all the CB-31-5 Diagnostics tests on both the 2 Hard Drives and 2 1.44M drives. The problem of trashed disks was the reason the Z386-16 was in the HUGBB Bargain Center [but it had a 1.2M 5" then]. Does anyone know of any problems with the DTC Controller used in the Z386-16?. I know the controller will not function in the slot next to the power supply because the backplane board has missing signals on the 'A' connector. Not bad connections NO RUNS must be a newer style board than the manual indicates. I also got the newest BIOS V3.2C -10 on the rom. Same problem. Any thoughts? I will pro-

bably just get a WD and forget the DTC, but it would be nice to know of any known problems with this setup since it is very possable that the drive and controller might function perfectly with other brand components. Any feedback would be of great help.

From: TOM LOOKER
Subj: Z-525 CACHE/WINDOWS 3 BUG?
I've been running into a curious bug in the Z-525 cache card when running with Microsoft's Windows 3.0--it may also be a problem with Windows 286 and 386, but I didn't notice it so clearly in those programs. What happens is that the Windows display is "messy"--a few of the icons seem to have extra lines in them, or extra shading; there's always a thick vertical line through the left-hand button in the upper right hand corner of the Windows display; sometimes when pop-up menus are released, smudgy lines of color will be left behind; sometimes the text under those menus looks smudged--as though a blotter had passed over wet ink and not been pulled up cleanly. The display problems are not massive--more of an annoyance than a serious disability. And scrolling the messy text off the screen, then bringing it back, cleans up that particular mess. When I turn off the cache card (using the ZSPEED3 utility--or removing the card altogether) the screen completely cleans up. The difference is dramatic if I start Windows with the cache, then pop into a DOS window and turn off the cache, and pop back into Windows. My system consists of a Z-386 /16, purchased in August; two Z-515 memory cards; a Paradise VGA Plus 8-bit card (driving a 1490 FTM); a DTC 7287 RLL controller (cousin to the 7280 which came with the machine); two 60 meg hard drives. Zenith DOS 3.3 Plus. I bought my Cache Card in Nov., and it's model version is 181-7320-2C. Three other people have reported the same problem & cure (turn off the cache). One has a SOTA/16 VGA card, one a Zenith VGA (don't know which number). Two people are running the Cache and Windows *without* a problem: one has a configuration almost identical to mine (Paradise VGA Plus, 16-bit; 5 meg of memory)--but he bought his cache card several months before I did. (One of the problem machines bought the cache in Feb.) Can anyone else confirm or deny this problem? It'd be good if you can include the version number of the cache or mention when you bought it, and include your video setup.

From: BRIAN HANSEN
Subj: Z427 HELP
I recently got a Z427-20 20 Meg. Tape Backup unit from the HUGBB Bargain Center and it did not have any documentation with the unit. I know it is a IRWIN Model:125 and it is made to connect to a 286/386 Floppy/Hard Drive Controller card. Can anyone give me any further details on this unit, such as how it is connected to the computer. It came with a 37 pin DB37P cable and looks like a 37 pin external floppy connector used on many computers. Also does anyone know the required software to use this unit. How about what type of cartridge it used. It kind of looks like maybe a cassette type. Thanks in advance for any information Brian Hansen

From: MARK SHALLOW
Subj: NEW DTP BBSI
Announcing a new bbs in the Sheboygan area...the Fontasy BBS...at (414) 458-7227...so ya all give me a call...here?

From: KEVIN COONEY
Subj: NEC SPINWRITER 3510
I saw your liquidation items included drivers for NEC printers (not specifically the 3510) and I was hoping you might have some literature on the NEC Spinwriter 3510. I got one from salvage and I think it's a serial printer. How can I can configure it correctly? Do you know of anyone who may be have some old literature. I can only make it self-test. I can't get it to print anything but garbage.

From: DON DECK
Subj: WINDOWS 3
Henry - an update to the Art Pease item on page 4 of July HSCOOP (the second mailing arrived today) - The problem with WINDOWS 3 and the 386/16 computers is NOT the 525 Cache Card. It has been confirmed to be a PAL on the 386/16 CPU card. The 444-536-4 chip should be replaced with a -5 chip. Chips prior to -4 MAY not have a problem, but -4 does and -5 fixes it. At this point you can not buy this $8.44 chip through Heath Parts but MUST buy it through a Zenith dealer. I would guess that you could buy it as a service center and sell it.

QUIKDATA BITS

Have the following computers left. One of the Heathkit **286LP Model 40** 8Mhz computers with 1 meg RAM, 40MB 28ms hard drive, two 3.5" 1.4mb floppy drives, two serial ports, one parallel port, VGA video card. See last month's issue for complete description. $995 includes UPS ground shipping

Still have the **TurbosPort 386** with 2MB RAM, 40MB hard drive, 1.4 meg flopppy and 2400 baud modem. Price reduced to sell at $2395. New dealer demo unit with full warranty.

One **MinisPort laptop** with 1MB RAM down to $695.

One **Z159** with 84 keyboard and two floppy drives, hercules video, 768K RAM MS-DOS. Brand new for $695.

Special still going on our QD88/12 12Mhz 8088 (V20) with 640K RAM, 360K floppy, 4 bay drive cabinet, 150W switching power supply, TTL video card with green TTL monitor, 8 expansion slots, serial, parallel, game port, 101 keyboard. $495

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(414) 452-4345 Bulletin Board: 300/1200/2400/9600 (Hayes) auto-baud recognition. Character width of 10 which includes start bit, 8 data bits (7 for ASCII character + 1 parity), and one stop bit. The parity can be omitted and then transmission of graphics and binary data is possible. 8 data bits allows secure error-checking data transfer methods such as XMODEM and YMODEM to be used.

Be sure to visit our bulletin board for latest prices and updates, new products, liquidation items, news items, and a place to leave and receive messages, info for H-SCOOP, etc.

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